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Is Vietnam economic paradigm sustainable for catch up

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Abstract

In the course of catching-up, Vietnam faces risks in two sectors: in real sector and in financial sector. In this paper we focus mostly on risk in real sector: the risk of getting stuck in middle-income trap. Vietnam is still far lagged behind her neighbors and much more further to developed economies. Does the economic paradigm that Vietnam follows in the last two decades allow her to catch up with those economies? We show that Vietnam's economic growth in the last two decades based essentially on cheap but low skill labor and physical capital. Participation in international and regional production network probably lock Vietnam in low-tech position, hence low value added. If Vietnam keeps on growing in present paradigm, hardly can it catch up the neighboring economies.

Key words: Flying geese paradigm, VAR models, TFP, Technological improvement, catch-up, Vietnam.

JEL classification: C30, O14, O19.

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1 Introduction

The Doimoi process has been launched out in 1986 when it represented an irreversible change in ideology. The Sixth Party Congress in December 1986 publicly rejected the fiction of trying to implement the central planning model, and instead declared its intention to move toward some form of mixed market economy (a multi-sector, market-oriented economy) with a role for the private sector to compete with the state in non-strategic sectors. This included agreement on the need for policy reforms aimed at reducing macroeconomic instability and accelerating economic growth, and that all economic levers (price, wages, fiscal and monetary policies) were to be used to achieve these objectives.

However, significant changes in this direction occurred only sometimes after the approval of the *Doimoi* (*Renovation*) program by the Congress[3]. In March of 1989, Viet Nam adopted a radical and comprehensive reform package aimed at stabilizing and opening the economy, and enhancing freedom of choice for economic units and competition so as to change fundamentally its economic management system.

In parallel with the economic reforms, the acceleration of the process of international economic integration has played a key role in enhancing efficiency and promoting economic growth. So far Viet Nam has entered into trade agreements with about 60 countries and has trade relations with some 170 countries. In 1992, Vietnam signed a trade agreement with the European Union (EU). In 1995, Vietnam joined ASEAN and committed to fulfill the agreements under the AFTA by 2006. Vietnam applied for WTO membership in 1995 and expected to be a member by the end of 2006. In 1998, Vietnam became a member of the APEC. In 2000, Vietnam signed the Bilateral Trade Agreement with the United States and the agreement became effective in December 2001. Most recent, Vietnam has also joined regional integration clubs such as ASEAN - China Free Trade Area (2002) and ASEAN-Japan Comprehensive Economic Partnership (2003). These reforms have created a huge market access for Vietnamese entrepreneurs and played a key role in booming of exports which is the main engine for growth in Vietnam.

[3] Viet Nam's Land Law of 1988, "Party Resolution 10," April 1988 abandoned the collective farming system that had been introduced in the 1960s; Resolution 27/HĐBT of March and Decision 16/NQTƯ of July 1988 officially encourage private enterprises; Law on foreign Investment 1987 to call for foreign investment.

These macroeconomic reforms have significantly changed the face of Vietnam's economy and society. In 1989 inflation was under control and since then it has gradually stood at a low rate[4]. From 1990 to 1997, the GDP growth rate was maintained at around 8 percent per annum on average. The GDP growth rate, however, went down between 1997 and 1999, partly because of the Asian financial crisis, and partly because of the dissipation of reform effects. Since 2000, the economy has regained its fairly high growth rate, 7 percent and more per annum (Figure 4).

Successful economic development has resulted in overall improvement of people's welfare and significant poverty reduction irrespective of measurement methods. The total poverty incidence declined from about 70% by the end of the 1980s to 58 percent in 1993, 37% in 1998 and further to 13.4 percent in 2009. Vietnam has also achieved notable results in human development. There has been a significant increase in Vietnam's human development index (HDI) (from 0.623 in 1994 to 0.689 in 2001 and to 0.731 in 2005).

Studies about the *Doi moi* process in Vietnam seem to agree that the success of economic renovation in Vietnam bases on two pillars: (*i*) gradually self-transforming economic structure from central planning to market-oriented; (*ii*) and pro-active international economic integration. Arkadie, B. and R. Mallon (2003), Vo Tri Thanh (2005), ADB (2006)… essentially emphasize on the role of institutional changes in development process and consent that the main engines of economic growth in Vietnam in the last two decades are exports and capital accumulation in which foreign capital plays an important role. Undoubtedly, Vietnam has benefited enormously from increased access to the world markets for its exports and growing FDI inflows. The economy has consecutively grown at high rates since Doimoi 1986.

In the course of catching-up, Vietnam faces risks in two sectors: in real sector and in financial sector. The risk in financial sector was studied thoroughly by Vo T.T and Pham C.Q (2008). Hence, in this paper we focus mostly on risk in real sector: the risk of getting stuck in middle-income trap. Vietnam is still far lagged behind her neighbors and much more further to developed economies. Does the economic paradigm that Vietnam follows in the last two decades allow her to catch up with those economies? Why in Asia, Japan, South Korea and Taiwan have successfully upgraded economies to the high income level while South East Asian economies such as Thailand, Malaysia, and Indonesia … seem getting stuck at middle-income level.

[4] In 2004 inflation rate (measured by CPI) increased considerably, to 9.5% from the low rates during 2000-03.

Economic literature proves that the crucial factor to sustainable growth and cath-up is technological progress. The Solow (1956) based on the classical assumption of diminishing returns to capital, states that without continuing improvement of technology per capita growth must eventually cease. The essential factor for economic growth, namely technological progress, is however, exogenous to the model. This shortcoming inspires scholars such as Romer (1986, 1987, 1990), Lucas (1988), Rebelo (1991), Grossman and Helpman (1991), Aghion and Howitt (1992) and many others to develop new "endogenous" growth models which provide more insight into the Solow.s residual. The endogenous growth models by taking human capital accumulation, learning-by-doing, research and development (R&D), and knowledge spillover in economic growth into account are able to generate long-term per-capita growth endogenously.

Recently, the spectacularly rapid growth of many Asian economies, especially the East Asian newly industrialized economies (NIEs) gave rise to a broad and diversified literature aiming at explaining the reasons for such a long lasting period of expansion (Kim and Lau [1994, 1996], Krugman [1994], Rodrik [1995], Worldbank [1993], Young [1994, 1995]). All these economies have experienced rapid growth of their physical capital stock and very high rate of investment in human capital.

On one hand, the supporters of the accumulation view stress the importance of physical and human capital accumulation in the Asian growth process. Accordingly, the main engine of "miracle growth" in NIEs is simply, very high investment rates. Young [1994, 1995], Kim and Lau [1994, 1996] found that the postwar economic growth of the NIEs was mostly due to growth in input factors (physical capital and labor) with trivial increase in the total factor productivity. Moreover, the hypothesis of no technical progress cannot be rejected for the East Asian NIEs (Kim and Lau [1994]). Consequently, accumulation of physical and human capital seems to explain the lion’s share of the NIEs growth process. Krugman [1997] wrote that Larry Lau and Alwyn Young works suggested that Asian growth could mostly be explained by high investment rates, good education and the movement of underemployment peasants into the modern sector.

On the other hand, the supporters of endogenous growth theory pinpoint productivity growth as the key factor of East Asian success. According to these authors, Asian countries have adopted technologies previously developed by more advanced economies (assimilation view) and "the source of growth in a few Asian economies was their ability to extract relevant technological knowledge from industrial economies and utilize it productively within domestic economy" (Pack [1992]). They admit that high

rates of investment into physical and human capital is necessary to achieve high economic growth rate. However, as stressed by Nelson and Pack (1998) there is nothing automatic in learning about, in risking to operate and, in coming to master technologies and other practices that are new to the economy. These processes require searching and studying, learning, and innovating to master modern technologies and new practices. Thereby, the economy enhances its stock of knowledge and efficiency. Implicitly, they suggest that technological progress exist and does play a crucial role in NIEs economic growth. Empirically, Collins and Bosworth [1996] or Lau and Park [2003] show Total Factor Productivity (TFP) gains actually matter in Asian NIEs growth and that future growth can be sustained. More precisely, Lau and Park (2003) show there was no technical progress for Hong Kong, Korea, Singapore, Taiwan, Indonesia, Malaysia, Thailand until 1985. However, in period 1986-1995 technological progress evidently contributes to economic growth in these economies. For Western Germany, United Kingdom, France, and Japan, technical progress always existed.

Cuong Le Van and Tu Anh Nguyen (2010) shows that high saving rates may play an important role in "miracle growth" in NIEs in the short and mid terms, especially, in transitional stage (catching-up stage) the high saving rate induces high growth rate of output. However, in the long term, the effect of high saving rate dies out and only total factor productivity (TFP) is the crucial factor of growth as claimed by Krugman.

Hence, if Vietnam economic paradigm fails to enhance its productivity, Vietnam will really be in risk of getting into middle income trap. In this paper we first examine Vietnam economic paradigm in framework of “Flying geese paradigm”. Secondly, the weakness and potential risks of the paradigm in an increasingly uncertain environment will be pointed out. Finally, we propose policy recommendation to minimize those risks.

2 Vietnam economic Paradigm

2.1 *A brief description of the “Flying geese paradigm”*

In the overall, the development paradigm of East Asian economies, including first tier NIEs and second tier NIEs[5], is akin to “flying geese paradigm” that Akamatsu firstly described in 1930s and published in 1961. In this section we briefly describe the paradigm and show that it fit well with growth path of Vietnam’s economy in the last two decades. Thereby, the weakness and risks of Vietnam economic paradigm could be highlighted.

[5] First tier NIEs are South Korea, Taiwan, Singapore and Hong Kong; Second tier NIEs are Thailand, Indonesia, Malaysia and the Philippines.

The paradigm has accurately depicted the East Asian catching-up process. The paradigm presupposes the existence of hierarchy, with a dominant economy acting as the growth centre and followed by other developing economies. The followers in pursuits of development emulate the industries of advanced economies in a manner compatible with its own factors and technological endowments at a given specific times. Accordingly, in the course of industrial development the followers experience three stages of catching-up:

Exporting primary commodities and importing foreign goods and capital. At this stage cheap imported goods benefit domestic customers but impoverish the local producers. The competition from foreign goods instigates local producers to learn and buy technology to produce those imported goods domestically.

Substituting imports: At this stage, local producers who acquire know-how and sufficient capital start producing import-substituted goods, and gradually drive foreign exporters out local market.

Exporting: Local production increases further to extent that excessively produced goods to be exported.

The figure 1 depicts the sequence of industrial upgrading in a developing economy that originally predicted by the paradigm. The sequence described in figure 1 can be applied for consumption goods and capital goods. The economy starts up with consumption goods then capital goods. At initial stage, a developing economy produces crude commodities (mining and quarrying, unprocessed agricultural products, basic consumption goods such as paper products, shoes, wearing apparel…,) for domestic use and export. The economy has to import complex and refined commodities from the more advanced economies. At time t_1 the developing economy start producing some of complex commodities by importing foreign technologies and capital (processed agricultural products, electronic products, auto parts ...). In parallel with producing complex consumption goods the economy gradually produces simple capital goods such as mechanical equipments. The sequence of industrial upgrading in capital goods sector takes similar shape as depicted in figure 1. By learning-by-doing and localizing, domestic production gradually drives out imports and start exporting to more advanced economies at time t_3. The refined commodities which require core technologies and capacity of blueprinting follow the same path but take longer time from import to domestic production and from domestic production to export. By moving up to producing more technology-intensive commodities, the developing economy lifts itself up to advanced economy. Consequently, the economy stops exporting crude commodities and even imports those commodities for producing complex and refined goods.

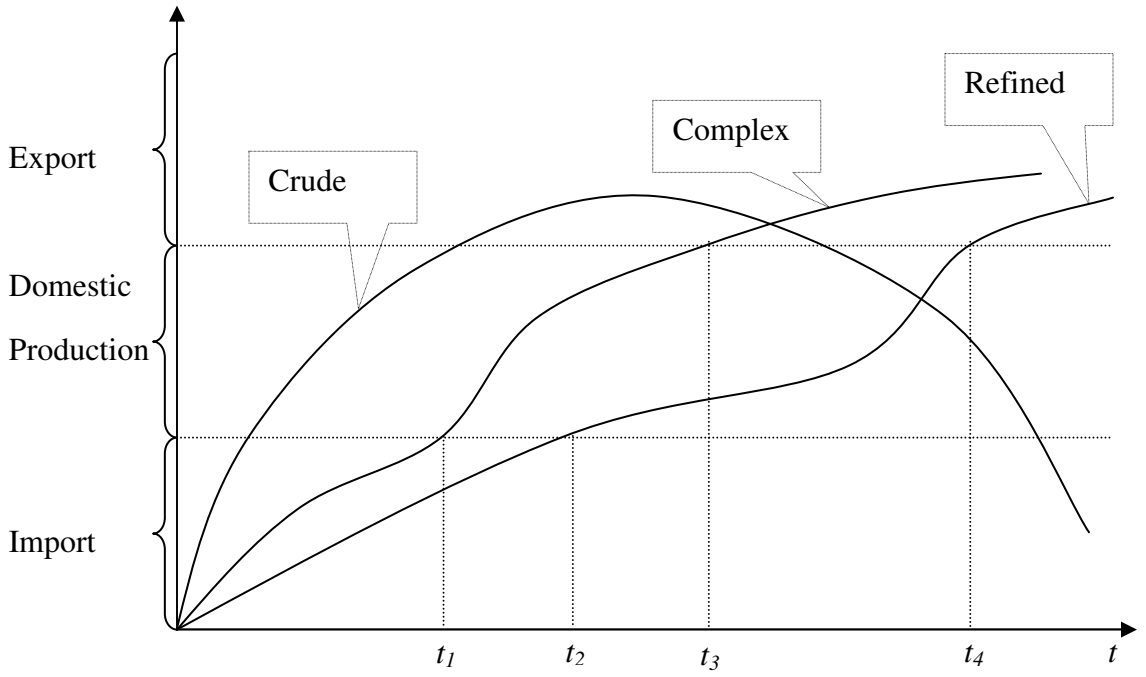


Figure 1: Sequence of industrial upgrading predicted by flying geese paradigm

The leap from import to domestic production depends crucially on transfer of technology. The mechanism of technology transfer, however, has not been mentioned explicitly in "flying geese" model by Akamatsu and his advocators. The advocators of "flying geese" presume that, the competition from foreign exporters can effectively activate the sense of urgency to catch up (or instigate the animal spirit) among local producers. Yet, it remains unclear how local firms that have been impoverished due to the competitive pressures of imports could overcome their overwhelmingly unfavorable situation. While imported products may expand consumer tastes and local firms may find new niches, the negative effects of competition caused by imported products can be so devastating that local firms may be totally crowded from the market, thus leading to the monopolization by imported products. In other words, when the local firms are totally eliminated and/or the local market is extremely small and unable to create any room for local firms, the question of who in the local market can pursue this possibility arises.

Ozawa (1991) argues that transnational corporations (TNCs), particularly those from Japan, would play a vital role in technology transfer through FDI. In addition to FDI, Ozawa identifies other channels which facilitate inter-economy industrial relocation: licensing, subcontracting, technical assistance contracts, turnkey operation, market agreements (especially easier access to the leaders markets), financial loans, and official economic assistance both financial and technical to build infrastructure. As long as

industrial upgrading occurs along the correct inter-economy sequence, TNCs do facilitate the restructuring of the economies of home and host economies.

Economic integration in the region which is led by TNCs, helps the orderly progress of all members of the flock and the emergence of a hierarchically organized regional division of industrial labor. The involved economies could avoid the situation of too many being engaged simultaneously in export-oriented production for a narrow line of product groups. FDI from more advanced economies, on the one hand, could help them remain competiveness by relocating to developing economies those industries and activities that have lost international competitiveness. This relocation, on the other hand, would help transfer technologies that are needed for upgrading export-oriented, competitive industries in developing economies.

In essence, the "flying geese paradigm" advocates an orderly progress of the whole flock (East Asian economies). All economies in the flock involve in a collective catching-up process as a group, it does not mention how one member of the flock can move forward relatively to others in the flock. In industrial level each member participates in one link in a production networks which led by a flagship firm from the most advanced economy (e.g. Japan). The flagship firm control core technologies and marketing network, middle layers manufacture parts and components. Less developed economies like Vietnam participate in the bottom layers doing assembly and packing (Figure 2). In this sense, the regional industrial restructuring process is characteristically a top-down one; the industrial restructuring in followers' economies initiated by leader's perceived imperative for their own internal restructuring, the followers lose their own initiatives.

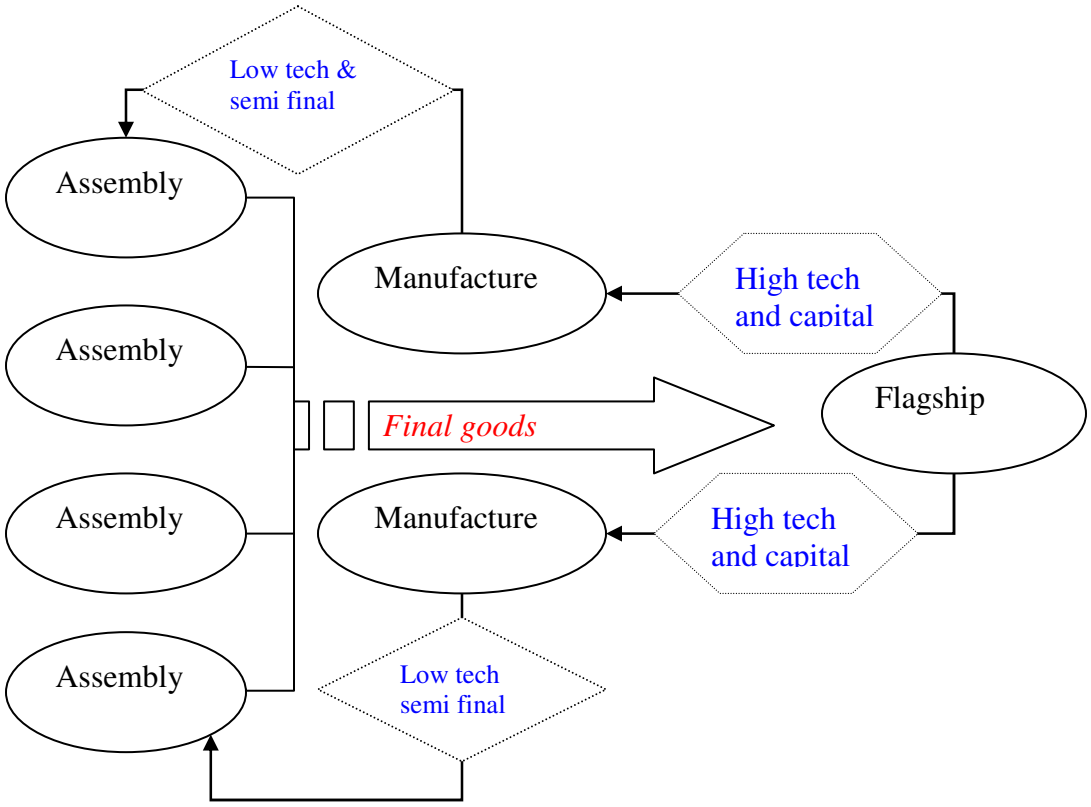


Figure 2: Orderly progress of the flock in a production network

It is worth noting that originally the "flying geese paradigm" that Akamatsu proposed for Japan's policies to catch-up with western economies is a bottom-up process: "the catching-up process is reflection of the follower economy's development aspiration". As soon as this paradigm was exported out of Japan, contemporary theorists (Japanese) advocated the top-down approach with Japan play the leading role in the region.

2.2 *Vietnam's economic performance since Doimoi*

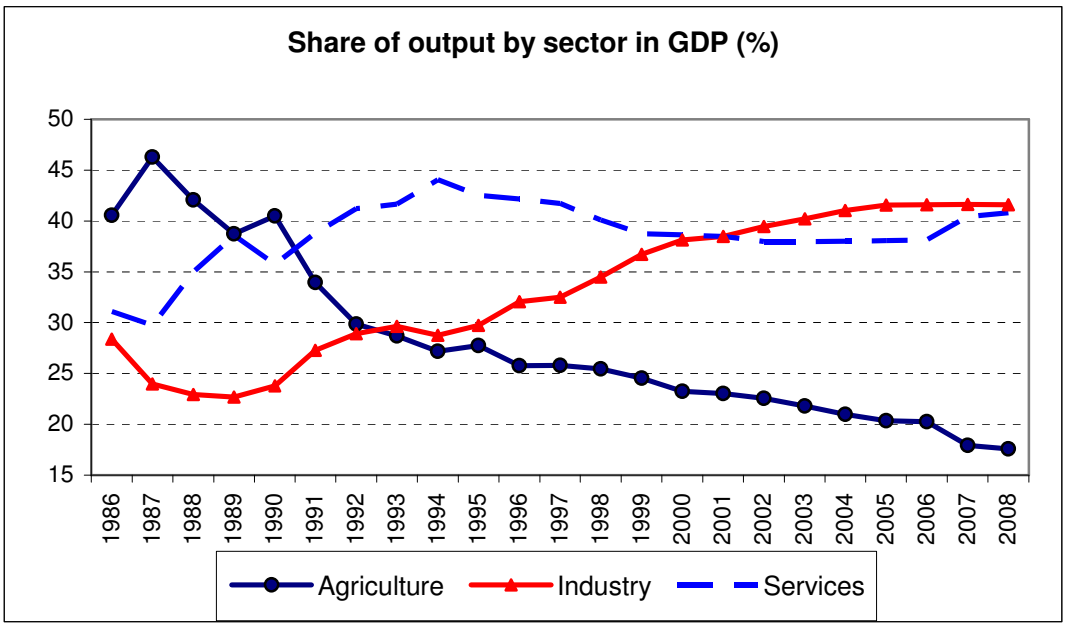
2.2.1 Overall view

Thanks to the determined and comprehensive economic reforms, including international economic integration, as well as positive impacts of high growth in its major trade partners, Vietnam achieved huge successes in a number of socio-economic aspects. In the years 1986-2008, GDP growth accelerated, from almost 3.6 percent in 1987 to 8.5 percent in 2007, and contracted to 6.18 percent in 2008 which partially affected by the subprime crisis. Annual average growth rate in the same period is 6.95%.

The share of agriculture-forestry-fishery sector went down continuously from over 40.56 percent in 1986 to 17.93 percent in 2008. On the contrary, the share of the

industry-construction sector as a whole decreased from 28.36 percent in 1986 to the trough of 22.67 percent in 1989 and kept on increasing since then to about 41.6 percent in 2008. The share of the services sector, meanwhile, kept on going up from 31.08 in 1986 to the peak of 44.06 percent in 1994 then has been relatively stable around 40 percent from that on (figure 3). Growth of the industry-construction sector has always been the fastest, on average the annual growth rates of Agriculture, Industry, and Service during period 1986-2008 are 3.8%, 9.22 and 7.35% respectively. Hence, since *Doi moi* Vietnam has not only consecutively archived high growth rate of GDP but also has changed its economic structure towards to a more industry-and-service-led one. In which the industry-construction sector has always been the driver of growth and a positive shifter of economic structure over the period.

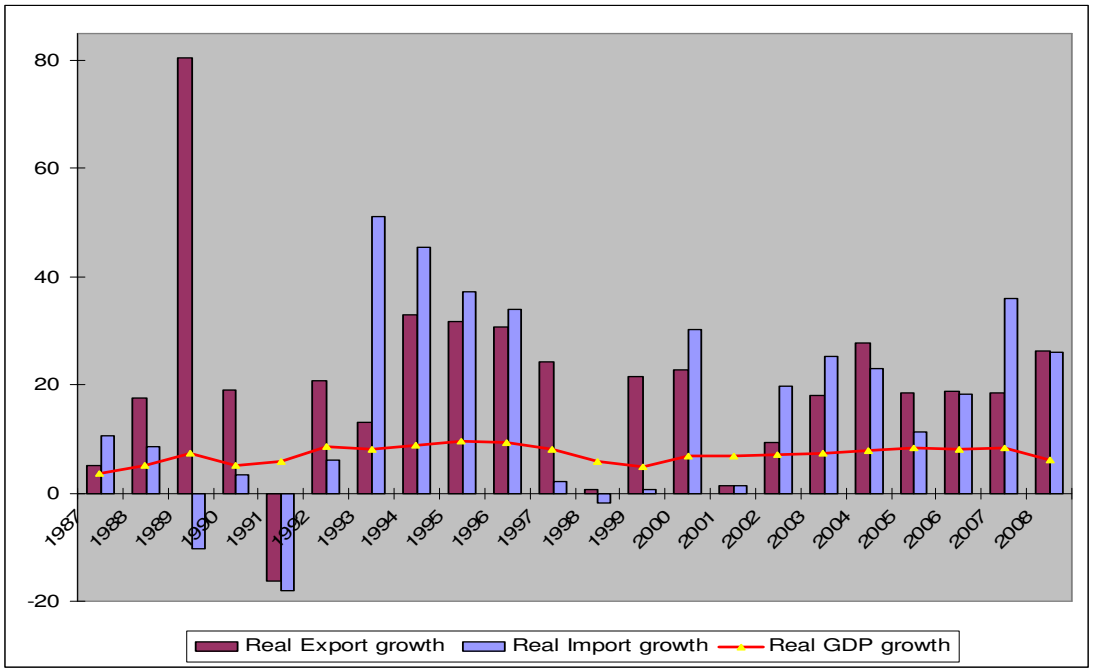
Figure 3: Structural change



Source: Calculated from GSO 2008 and CEIC data base.

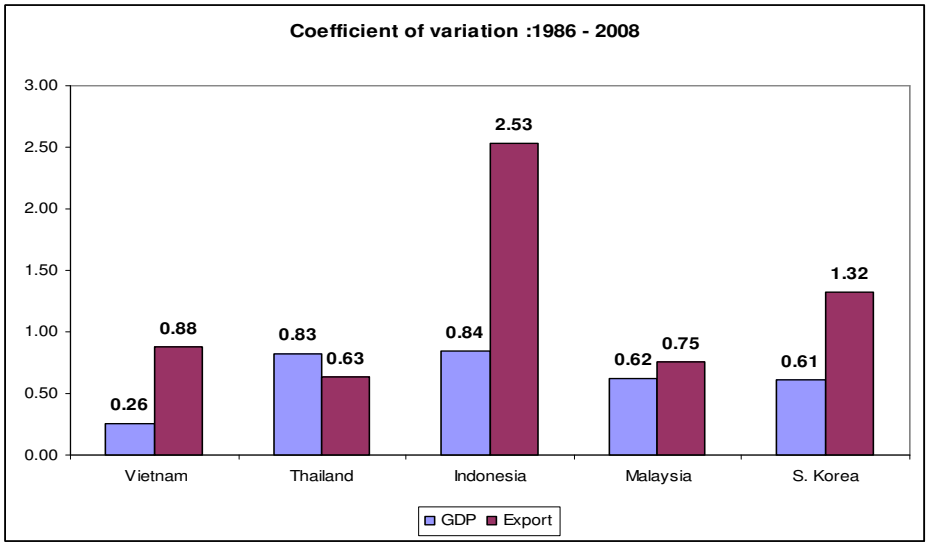
As depicted in Figure 4, Vietnam's trade has also expanded continuously during the period of 1986-2008. The GDP growth seems being driven by international trade. It evidenced that Vietnam has increasingly integrated into the international economy since 1986; both exports and imports have risen at impressive paces, with the annual average growth rates during period 1986-2008 are 19% and 15% respectively. Initially, Vietnam had to import much more than its export (in 1986 the Vietnam exported 789.05 million USD while it imported 2155.1 billion USD). Consequently, even on the average, the annual growth rate of export is higher than that of import, Vietnam still suffers huge trade deficit ; in 2008 the real trade deficit reached 16.619 billion USD (in 2005 price).

Figure 4: Growth of GDP, export and import in real term



Source: *CEID and GSO 2008 for GDP growth, Import and export in current USD. The author use US's GDP deflator (World Bank 2009) to calculate real growth rates of Imports and Exports.*

Figure 5: The coefficient of variation of growth of GDP and ex port



Source: *Calculated from GSO 2008, CEIC Database for Vietnam and World bank 2009 for other countries.*

Interestingly, though Vietnam's economy deeply integrated into international economy and export and import are quite volatile, the GDP growth is rather stable during the period 1986-2006. More specifically, during the period of 1986-2008 the coefficient

of variation of growth rate of GDP, export and import are 0.26, 0.88 and 1.1 respectively. In the same period, its neighboring economies Thailand, Indonesia, Malaysia and S. Korea also faced high volatility of export growth, especially Indonesia and S. Korea. The volatility of Vietnam's export is even higher than Thailand's and Malaysia's. However, Vietnam's GDP growth is much more stable than its neighboring economies (Figure 5).

It is worth noting that, before the Asian crisis 1997, the performance of these economies is much better than Vietnam: higher growth and more stable (Table 1). After having escaped from crisis, since 1999 these economies have not yet gained their previous level of growth rates and they also suffer from more volatility in growth. Interestingly, although in the post-crisis period Vietnam's economy has integrated into the international economy much more than it did in pre-crisis period, its growth rate in the later is higher and more stable in the former. This partially due to prior 1997 Vietnam's economy was still in the initial stage of integration into the international economy, hence it was less affected by the crisis. In the post-crisis period Vietnam have made used of the region's recovery momentum and gained high growth rate. Table 1 also shows that the more stable, the higher the economy grows.

Table 1: GDP growth and its coefficient of variation in different periods

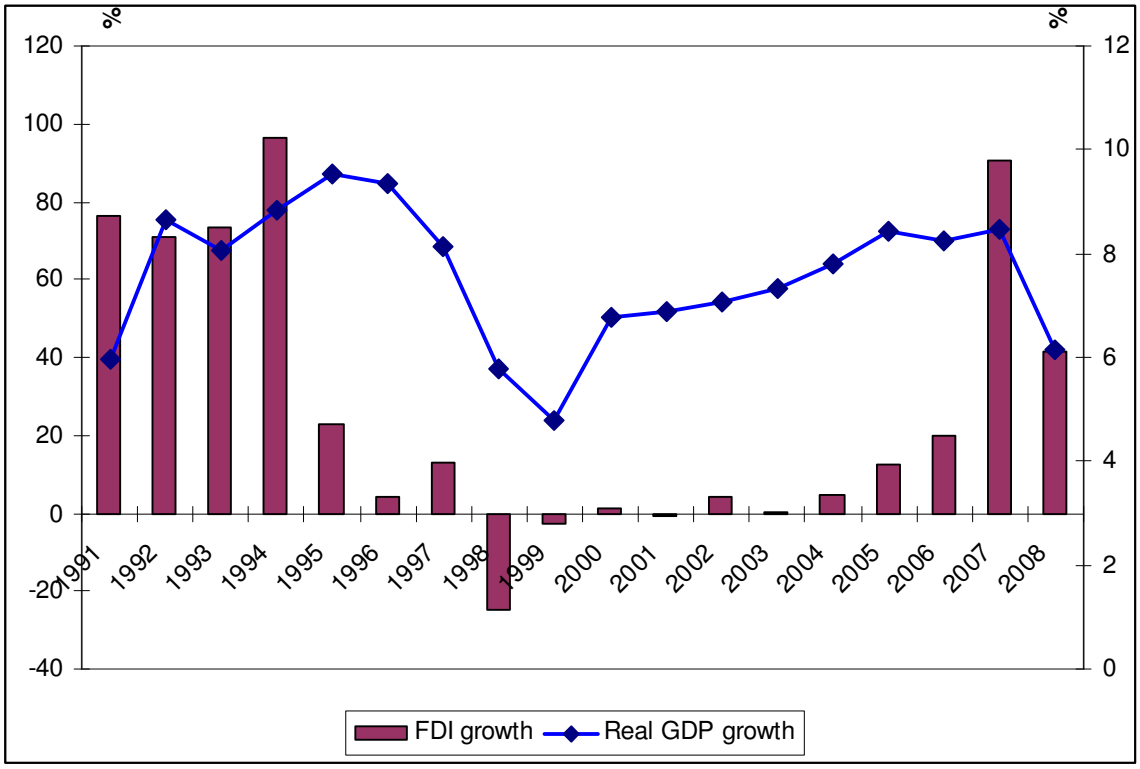
Periods		**Vietnam**	**Thailand**	**Indonesia**	**Malaysia**	**S. Korea**
1986-2008	Growth	**6.95**	**5.81**	**5.18**	**6.24**	**6.34**
	C.V.	0.26	0.83	0.84	0.62	0.61
1986-1996	Growth	**6.74**	**9.13**	**7.51**	**8.32**	**8.56**
	C.V.	0.35	0.26	0.17	0.33	0.22
1999-2007	Growth	**7.19**	**4.74**	**4.71**	**5.54**	**5.27**
	C.V.	0.16	0.32	0.34	0.38	0.45

Source: cited in figure 4

On the investment side, foreign capital also plays an important role in Vietnam's economy since *Doimoi*. The FDI growth (real implemented capital) and GDP growth that depicted in Figure 6, look moving with akin rhythm. In period 1991-1995 FDI (implemented capital) increased dramatically, with more than 40% of annual growth rate. The GDP growth rate was more than 8% yearly in the same period. The effect of Asian crisis 1997 was evidenced in the growth rate of FDI in period 1996-1999; the growth rate

of FDI slowed down from 4.3% in 1996 to -24.85% in 1998 and -2.8% in 1999. The GDP growth declined steadily to 4.77% in 1999. The years 2000-2003 saw FDI inflows to Vietnam being recovered but quite stagnant. The decreasing trend stops in 1999 and slightly recovered in 2000 with growth rate of 1.18%. However, up to 2004, the growing trend was not clear. The unattractiveness of Vietnam's investment environment relative to other countries in the region, especially to China is one of the key explanations for this situation (Nguyen Thi Tue Anh 2005). Notwithstanding the decrease in implemented capital, the number of new FDI projects went up continuously, from 285 to 791 in period 1998-2003.

Figure 6: Growth of real implemented FDI and GDP1991-2008.



Source: GSO in various issues, and the author uses US's GDP deflator (World Bank 2009) to calculate real number. FDI growth is referred to left axis, GDP growth is referred to right axis.

Since 2004, FDI inflows into Vietnam started to go up. The growth rate steadily increased from 4.65% in 2004 to 90.4% in 2007 and slightly slowed down to 41.34% in 2008. The number of new projects increased from 811 in 2004 to 1544 in 2007, and 1171 in 2008. Total FDI registered capital also rose from over USD 4.5 billion in 2004 to above USD 21.34 billion and USD 64.011 billion in 2007 and 2008, respectively. The high increase in FDI inflows in this period could be attributed to the improved investment

environment after revising the Foreign Investment Law[6], and the Government's permission for foreign investors to invest in some previously-Government-monopolized industries e.g. electric supply, insurance, banking, communication (Nguyen Thi Tue Anh 2005). Furthermore, the years 2004-08 also witnessed greater efforts by Vietnam to promote investment inside and outside Vietnam. The GDP growth rate sturdily recovered since 2000 and reached the peak of 8.48% in 2007 before slowed down to 6.15% in 2008 due to effect of subprime crisis.

2.2.2 A closer look

Figure 7 depicts the shares of registered FDI inflows into Vietnam in the years 1988-2008 by economies and region. The main source of FDI inflow into Vietnam over the past 20 years is from East Asian economies, which accounted for 65.08 percent of the total. Japan and four economies of first tier NIEs: Taiwan, S. Korea, Singapore and Hong Kong SAR, all accounted for lion shares in total FDI into Vietnam. Respectively, the shares of these economies are 10.61%, 12.81%, 10.19%, 10.43% and 4.53%. Two most advanced economies of second tier NIEs, Malaysia and Thailand have also taken significant part. The share of Malaysia's is 11%, alike those of Taiwan and S. Korea.

It should be noted, however, that this comparison only takes into account direct amount of registered capital, rather than the origin of investment or actually implemented capital. Due to data unavailability, similar comparison using implemented capital is by no means possible, despite its greater informational value. Besides, registered capital only considers direct registration by foreign enterprises, without caring for the *actual* origins of their capital. Taking this problem into account, the rankings would be dramatically different. For example, the joint study by MPI/FIA and USAID/STAR in 2005 figured out that taking actual origin of capital will bring the US to the first place, as much of the investment capital from the US were channeled to a third country before reaching Vietnam.[7]

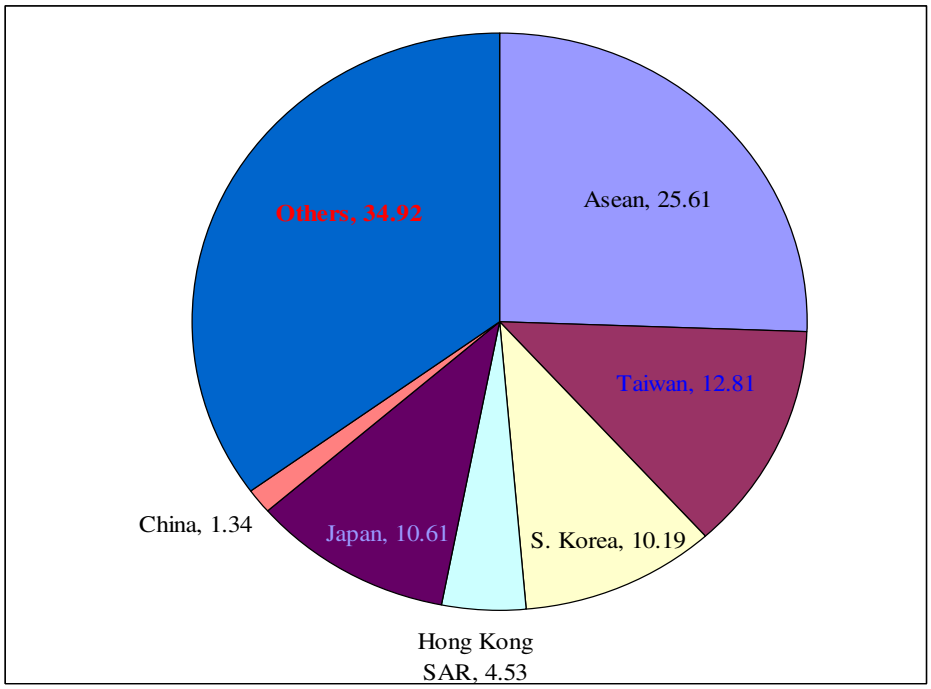
The majority of FDI projects and registered capital concentrated in industry and construction, whilst those into agriculture-forestry-fishery were rather limited. The industry-construction sector accounted for 68 percent of FDI projects, and 65 percent of FDI registered capital. Meanwhile, the agriculture-forestry-fishery only attracted 7 percent of FDI projects and 4 percent of FDI registered capital. It can be seen then that the agriculture-forestry-fishery sector has been relatively disadvantaged in attracting FDI

[6] Before the enactment of the Law on Investments 2005 and Enterprise Law 2005, foreign investors and foreign invested enterprises were regulated differently from domestic investors and national invested enterprise by separate laws. In 2005 these discriminations were removed, foreign investors and national investors are all regulated by Common Law on Investment and Unified Enterprise Law.

[7] In the period 1988-June 2006, US-related registered FDI is found to be twice as large as US-reported registered FDI (STAR, CIEM, and FIA 2007).

inflows. Notwithstanding its important role in Vietnam's socio-economic development, the sector and their farmers/workers appears to enjoy relatively less benefits from FDI attraction than those in other sectors. The services sector made up shares of 25 percent in total projects, and of 31 percent in total registered capital. This situation will expectedly change in a dramatic way over the forthcoming years, as Vietnam is set to open up its services sector to fulfill its WTO commitment. Specifically, more FDI projects in the services sector, particularly ones with high value added and profitability, will be expected.

Figure 7: **Share of registered FDI by economies and region in the total: %**



Source: GSO in various issues

Together with their increasing presence, the FIEs are undertaking a greater role in Vietnam's economy (Table 2). The share of FDI in gross investment went up from 18.0 percent in 2000 to 29.8 percent in 2008. The number of employees in FIEs rose continuously and accounted for 4 percent of total employees in 2008. The employees in domestic private firms and FIEs altogether accounted for more than two-thirds of employees in the business sector (Dinh Van An 2009). FIEs are also producing greater values of industrial products. To date, it contributes more than 40.2 percent to Vietnam's total industrial products. In another aspect, they are making greater contribution to GDP and budget revenues. Their share in the country's budget revenues went up from 13.3 percent to 17.7 percent in the years 2000-07 (Dinh Van An 2009)

Table 2: Shares of FIEs in Vietnam's employment, GDP, industrial production, and total investment

Unit: Percent

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Employment	0.99	1.16	1.49	1.91	2.29	2.66	3.08	3.49	4.00
GDP (at 1994 prices)	10.82	10.85	10.86	11.18	11.56	12.07	12.75	13.26	13.53
Industrial output (at 1994 prices)	35.94	35.30	35.43	35.78	36.04	37.28	38.21	38.89	40.24
Investment	18.00	17.60	17.40	16.00	14.20	14.90	16.20	24.80	29.80

Source: GSO.

Vietnam's imports also show the same pattern as FDI: East Asian are the dominant import market for Vietnam (Table 3). The shares of these economies in Vietnam's import in the years 1998-2008 range from 73.65 percent to 79.19 percent of the total import. ASEAN as a whole has been the largest market for the whole period; their shares range from 23.56 percent to 29.44 percent, outdistance the runners-up whose shares are around 11 – 13 percent. Japan, Taiwan and South Korea, are also in the dominant group, with more than 10 percent for each.

Table 3: Shares of East Asian partners' export in Vietnam import: percent of total

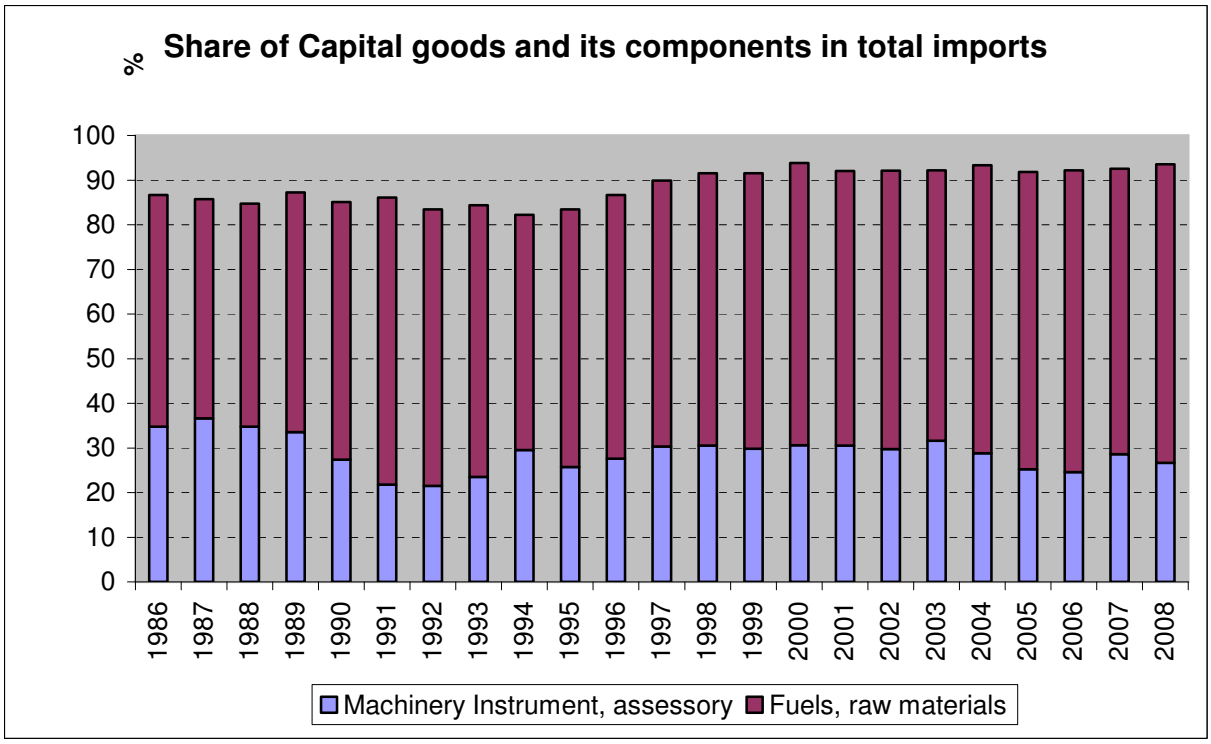
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
ASEAN	29.44	28.03	28.45	25.73	24.15	23.56	24.30	25.37	27.95	25.32	24.25
Taiwan	11.98	13.34	12.02	12.39	12.79	11.54	11.57	11.71	10.75	11.02	10.36
South Korea	12.36	12.65	11.21	11.63	11.54	10.40	10.51	9.78	8.71	8.50	8.75
Hong Kong	4.85	4.30	3.82	3.31	4.08	3.92	3.36	3.36	3.21	3.09	3.26
Japan	12.88	13.78	14.71	13.46	12.68	11.81	11.11	11.08	10.47	9.84	10.21
China	4.48	5.73	8.96	9.90	10.93	12.43	14.37	16.05	16.46	19.92	19.39
East Asia	***75.98***	***77.83***	***79.19***	***76.42***	***76.18***	***73.65***	***75.22***	***77.35***	***77.55***	***77.69***	***76.23***
Euro zones*	17.05	16.69	14.97	15.25	14.08	13.90	12.83	11.78	12.55	13.07	12.03

** Euro zone here includes six main partners: Germany, France, Italy, Spain, Netherlands, and Belgium.*

Source: GSO

This period saw the rapid of China. The share of China in 1998 is only 4.48 percent, the figure rose dramatically to nearly 19.4 percent in 2008. The rise of China has gradually crowded out shares of the three East Asian economies and ASEAN economies. Even though these economies remain claim lion shares in total Vietnam's import.

Figure 8: Share of capital goods and its components in total imports



Source: GSO and CEIC.

The salient characteristic of Vietnam's import is the domination of capital goods. In prior crisis period (1986-1997) capital goods accounted for a fairly stable share of around 85 percent of the total imports. In post-crisis period Vietnam increased its import of capital goods to more than 90 percent (Figure 8). It should be noted the expansion of share of import of capital goods in the whole period 1986-2008 is crucially ascribed to the expansion of imports of fuels and raw materials. It evidences that Vietnam has not improved its capacity to produce inputs for production since 1986 and increasingly depends on imported inputs for production. Vietnam's economy has grown in width not in depth since *Doi moi.* Data in Table 2 and in Figure 8 also imply that Vietnam has imported mainly capital goods from East Asia.

In contrast to import, share of East Asian economies' import to Vietnam total export steadily decreased from 55.45 percent in 1998 to 43.48 percent in 2008 (Table 4). The ASEAN continued to be an important market, they absorb around 16% of total Vietnam's exports. South Korea, Taiwan, and China to some extent, exported largely to Vietnam in the years 1998-2008, however they absorbed quite small share of Vietnam's exports. Fortunately, the declining of East Asia's share has been offset by the increase of US market. Thanks to Vietnam-US bilateral trade agreement, which came into effect in 2001 the US's share increased steadily from 5.06 percent in 2000 to 20.8 percent in 2007

and slightly went down to 18.9 percent in 2008. Other important markets for Vietnam's exports include, but are not limited to, Australia, The Netherlands, Germany, France, UK,

Table 4: Share of East Asian partners' import in Vietnam's export: percent of total

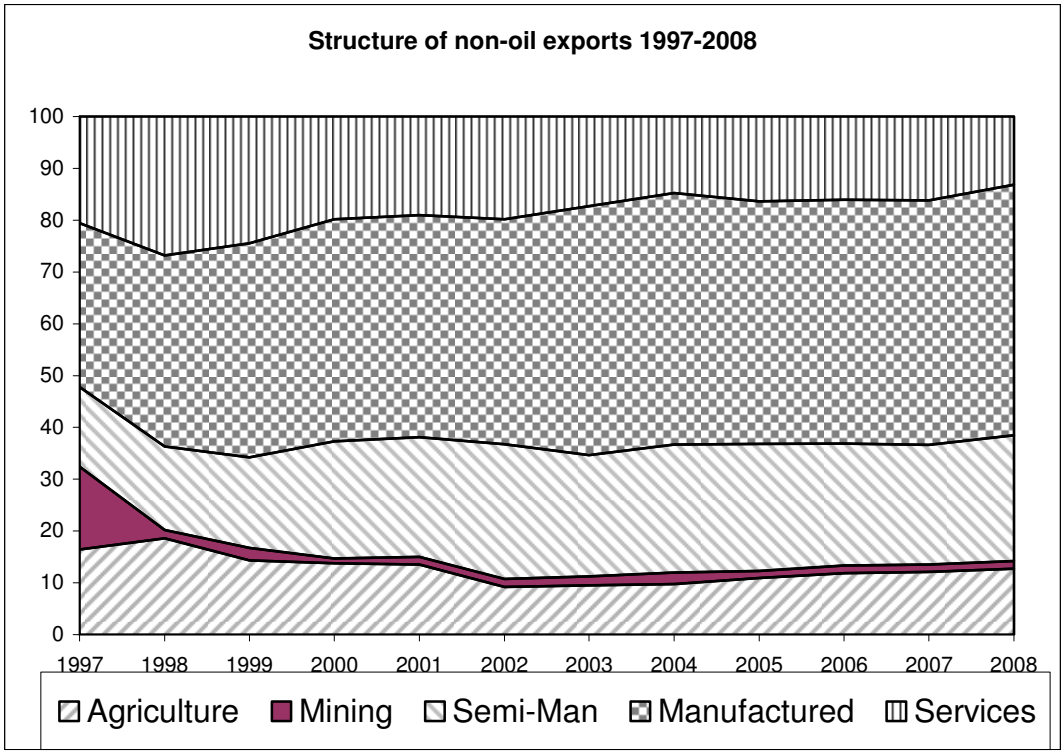
	1998	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
ASEAN	21.56	21.79	18.07	16.98	14.57	14.65	15.28	17.70	16.64	16.09	16.22
Taiwan	7.16	5.91	5.22	5.36	4.89	3.72	3.36	2.88	2.43	2.35	2.23
South Korea	2.45	2.77	2.43	2.70	2.81	2.44	2.30	2.05	2.12	2.58	2.84
Hong Kong	3.40	2.04	2.18	2.11	2.04	1.83	1.44	1.09	1.14	1.20	1.40
Japan	16.18	15.48	17.78	16.70	14.59	14.44	13.37	13.38	13.16	12.50	13.58
China	4.70	6.47	10.61	9.43	9.09	9.35	10.95	9.95	8.14	6.91	7.21
East Asia	**55.45**	**54.46**	**56.30**	**53.29**	**47.98**	**46.43**	**46.69**	**47.04**	**43.63**	**41.63**	**43.48**

Source: GSO

In the years 1997-2008 also saw the gradual expansion of exports of manufacturing and semi-manufacturing (Figure 9).The share of manufacturing and semi-manufacturing production increased from 31.64 percent and 15.38 percent in 1997 to 48.35 percent and 24.26 percent in 2008 respectively. At the same time, the share of mining declined sharply from 15.94 percent in 1997 to 1.61 percent in 1998 and then stabilized around 1.5 percent in the following years. The share of agriculture and services in export of non-oil products also show declining trend in the period. This implies that Vietnam's services industry is losing its international competitiveness in comparison with manufacturing industry.

Table 5 shows top 15 imports and exports of manufactured goods in Vietnam. The dominants of exports are low-tech products such as wearing apparel, metals and metal products. Vietnam also exports some high-tech products like machinery used for broadcasting, television and information activities, and other electrical machinery and equipment however as shown in next section, these products depend heavily on imported inputs and Vietnam just to conduct low-tech steps in the total value chain. It also worth noting that these main exports are also of advantages neighboring economies such as China, Thailand, The Philippines, etc.

Figure 9: Structure of non-oil exports 1987-2008



Source: GSO.

2.3 *Is there any technological improvement*

Based on Standard Industry Classification (SIC 3.0) by United Nations and database from General Statistics Organization (GSO) we, in this study, classify Vietnam's industrial commodities into two groups: the high-tech (whose codes in SIC 3.0 are 24, 29, 30, 31, 42, 33, 34, and 35) and low-tech (the left)

Table 5 shows that between 1999-2008 ratios of output and value-added of high-tech commodities to those of the whole industry in Vietnam were in upward trends. Specifically, in comparison with the ratio of value-added, the ratio of output increased more quickly and sturdy (from 19.65 percent in 1999 to 23.99 percent in 2008). The ratio of value-added slightly improved but the increment is trivial and not steady. In general, Vietnam's industry has expanded its production of high-tech in relative to production of low-tech production, though at modest rate.

Table 5: Ratio of output and value-added (%)

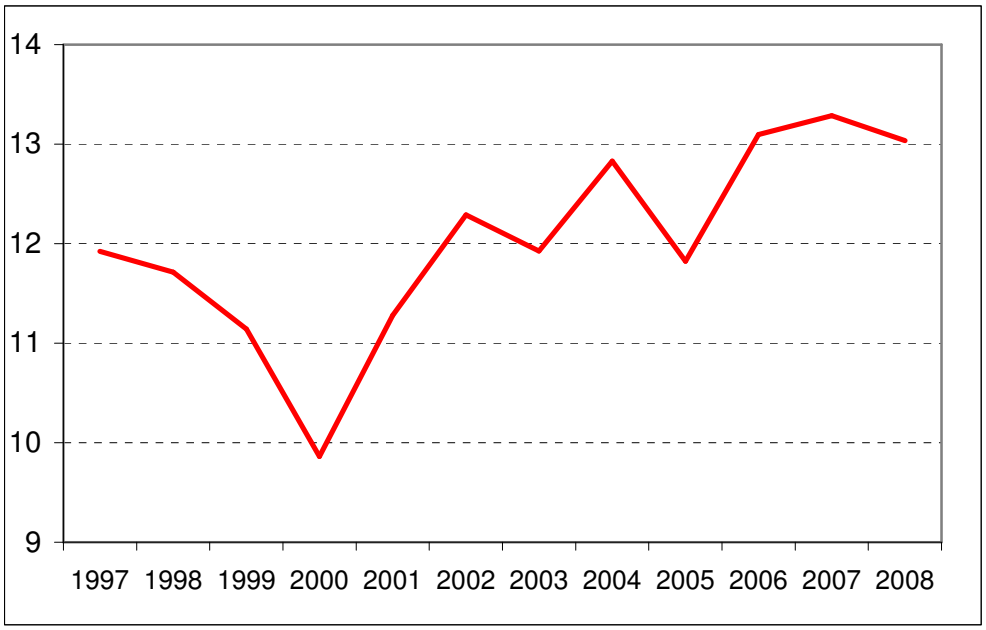
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Output	*high-tech*	19.65	19.84	20.62	21.53	21.64	21.97	22.71	23.18	23.56	23.99
	low-tech	80.35	80.16	79.38	78.47	78.36	78.03	77.29	76.82	76.44	76.01
Value added	*high-tech*	18.31	17.80	18.38	19.07	18.52	18.15	18.23	19.10	19.46	19.67
	low-tech	81.69	82.20	81.62	80.93	81.48	81.85	81.77	80.90	80.54	80.33

Source: GSO

On international trade, figure 9 shows the slow movement of exports. The export of high-tech products is still very modest, just around 13 percent. However, the bright aspect is that from 2000 on, the ratio of high-tech exports to total exports of industrial goods has increased fairly steadily.

In general, in the last 10 years Vietnam's industry has improved slowly towards high-tech ends. However, this point should be considered with caution. Table 7 also shows that the contribution of high-tech industries to the value-added of the whole industry is almost unchanged in the same period. At the same time, the ratio of high-tech output to output of the whole industry steadily increased from 19.65 percent in 1999 to 23.56 percent in 2007.

Figure 10: Ratio of exports of high-tech products to the exports of the whole industrial products



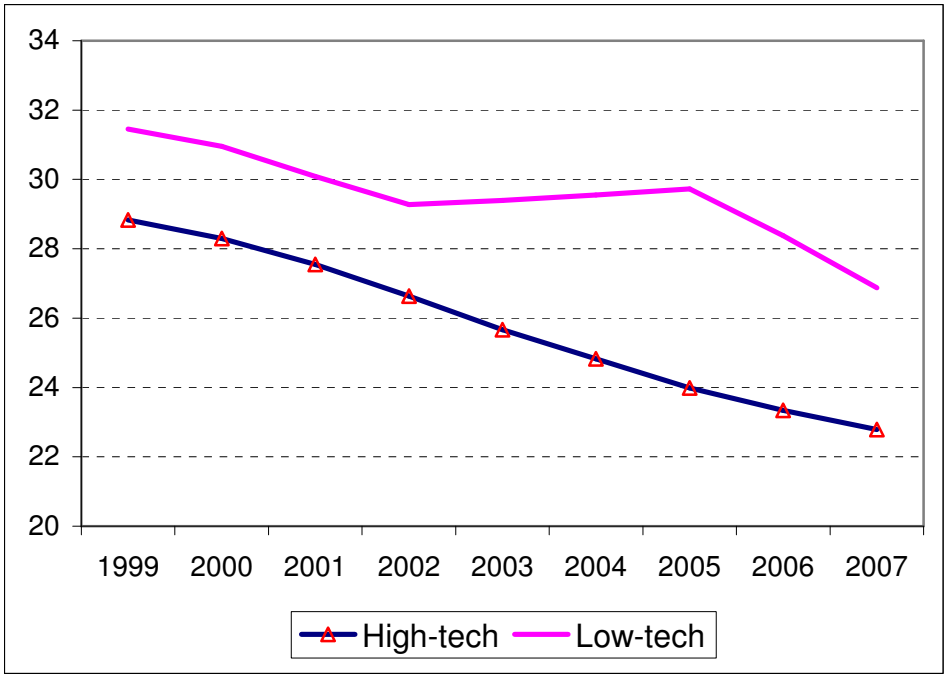
Source: GSO

Hence, the industry of Vietnam is mainly low-tech which more than 80 percent of value-added is contributed by low-tech industries and this situation almost unchanged in the last decade. This implies that although, in appearance, Vietnam's industry has moved slowly towards high-tech industry in the last 10 years, in essence, it has not. The value-added per unit of output has consecutively declined in the same time.

2.3.1 Imported intermediaries

Figure 11 below shows that proportions of value-added to output of low-tech and high-tech products have been at low level: around 30 percent for low-tech products and 23 percent for high-tech ones. Moreover, these ratios consecutively decreased in the period 1999-2007, in which the latter decreased faster than the former. This implies that the industry in Vietnam depends heavily on imported inputs and this situation has not been improved in the last 10 years but got worse. Furthermore, small value-added of high-tech products that produced in Vietnam also indicates that, in essence, Vietnam just produces low-tech parts in the whole production chain of those high-tech products. Vietnam has not yet taken high-tech parts which give higher value-added.

Figure 11: Proportion of value-added to output



2.3.2 Labor and capital income

Let's define:

$$Y_t^h = L_t^h w_t^h + K_t^h r_t^h + VC_t^h \quad (1)$$

be output of high-tech industries at time t;.

$$Y_t^l = L_t^l w_t^l + K_t^l r_t^l + VC_t^l \quad (2)$$

be output of high-tech industries at time t.

Where L, K, VC, w, and r are labor, capital, variable costs, wage and interest rate of capital used in production respectively; indexes *h* and *l* denote for high-tech and low-tech.

Theoretically, high-technology uses inputs more efficiently by improving productivity of labor and capital, hence is classified into three types: (*i*) the labor-augmenting; (*ii*) the capital-augmenting; (*iii*) and Hicksian neutrality.

In empirics, the high-tech industries are characterized by:

- low rate of variable costs to output, i.e.: $\frac{VC_t^h}{Y_t^h} < \frac{VC_t^l}{Y_t^l}$

- if high-tech industries are labor augmenting, share of labor income in output would be higher than that in low-tech ones: $\frac{L_t^h w_t^h}{Y_t^h} > \frac{L_t^l w_t^l}{Y_t^l}$

- if high-tech industries are capital augmenting, share of capital income in output would be higher than that in low-tech ones: $\frac{K_t^h r_t^h}{Y_t^h} > \frac{K_t^l r_t^l}{Y_t^l}$

- if high-tech industries are Hicksian neutrality both shares are better than the correspondents in low-tech industries.

Table 6: Proportion of labor income and capital income in output (%)

		1999	2000	2001	2002	2003	2004	2005	2006	2007
Labor	**High-tech**	14.84	14.60	14.18	13.58	12.99	12.50	12.15	11.82	11.51
	Low-tech	12.22	12.03	11.73	11.38	11.50	11.64	11.73	11.10	10.59
Capital	**High-tech**	11.11	10.98	10.68	10.34	10.11	9.73	9.19	9.31	9.16
	Low-tech	14.22	13.81	13.42	13.16	13.45	13.67	13.82	13.46	12.86
VC	**High-tech**	74.05	74.42	75.14	76.08	76.9	77.77	78.66	78.87	79.33
	Low-tech	73.56	74.16	74.85	75.46	75.05	74.69	74.45	75.44	76.55

Source: GSO.

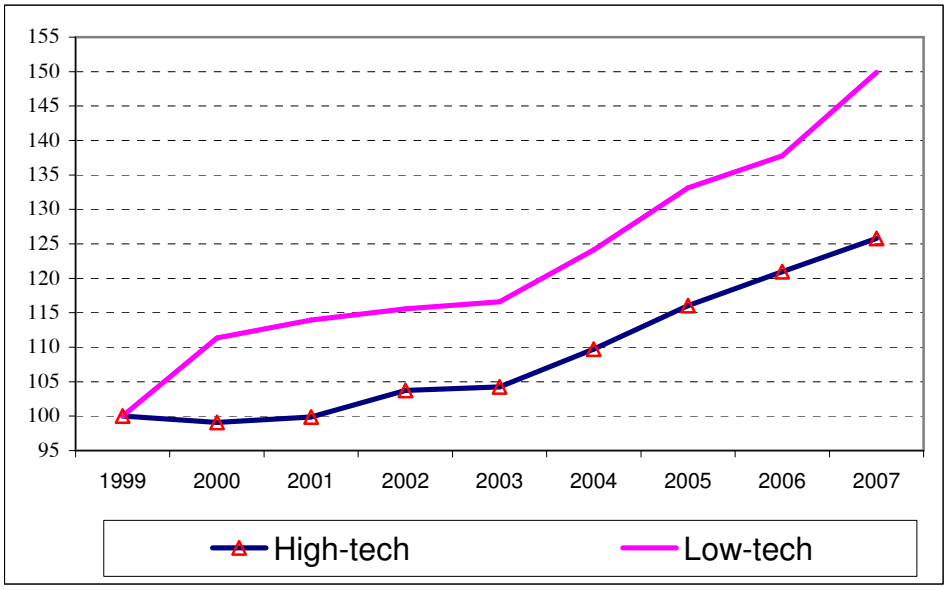
Table 6 shows that the proportion of variable costs in output is higher in "high-tech industries" than in "low-tech industries". It means that "low-tech industries" use inputs more efficient than the "high-tech industries". Hence the so called "high-tech industries" are not real ones in Vietnam.

In addition, shares of labor income and capital income kept decreasing since 1999 in both groups. It implies that in the last ten years technological progress in both groups of industries has not been evidenced.

The implication is that Vietnam just participates in low-tech stage in producing high-tech products, which use mostly labor and low-tech capital. The worse thing is that this situation seems getting worse in last ten years.

2.3.3 Prices

Figure 12: Movement of prices (%)



Source: GSO

In period 1999-2007 prices of low-tech products increased 150% while prices of high-tech products increased only 126% at the same time (figure 12). Furthermore, in the whole period the growth of prices of high-tech products is always lower than the growth of prices of low-tech. It means that the relative prices of high-tech products consecutively declined in the same period. This is partly due to fast improving productivity in high-tech industries in international market. If the growth of productivity in Vietnam is lagged

behind the international growth rate, Vietnam's high-tech industries will have to face with adverse relative prices. Accordingly, investment in high-tech industries in Vietnam is less and less profitable than investment in low-tech industries. Unfortunately, the previous sections indicate that this seems be the case for Vietnam's industry.

2.3.4 Total factor productivity

Hence, these reforms are expected to increase Hicks-neutral productivity, which will be examined in section result. In the model used for examining TFP growth and production specification will be presented in following section.

Consider an aggregate production function mapping capital K_t and labor L_t, into output Y_t. Assume that capital and labor are assumed internally homogeneous and continuously substitutable factors of production. The production function is assumed to be twice differentiable and linearly homogeneous.

$$Y_t = A_t F(K_t, L_t) \qquad (1)$$

where Qt, Kt, Lt are the level of output, capital stock and employed labour respectively, and At is level of technology at time t . F(.) is homogeneous degree one.

Ravankar (1971) and Bairam (1989) suggest the production function

$$Y_t = A_t K_t^{a} L_t^{1-a} e^{bk_t} \qquad (2)$$

$\in$ is defined as substitution parameter.

This specification (see Bairam [1989]) works well in estimating the production function of Japan's economy in industrializing period 1878-1939. Vietnam also started industrializing her industry since 1986, hence in this study I also apply this specification to estimate Vietnam's production function in period 1986-2007.

If $b = 0$, the production function is a Cobb-Douglass form, if $b \neq 0$, the production function is a variable elasticity of substitution (VES) one.

In this study the TFP growth is assumed to be driven by learning-by-doing and other exogenous factors. The concept of learning-by-doing was firstly incorporated into a macroeconomic model by Arrow (1962). In his model, part of the technical change process does not depend on the passage of time as such but develops out of experience gained within the production process itself. Mathematically, the model assumes that a labour efficiency index associated with workers of a particular vintage is a strictly increasing function of cumulative output or gross investment. Such a relationship is expressed as .

$$A_t = A_0 E_t^q \qquad (3)$$

where A_0 is the initial level of technology. E_t is the index of experience at time t and $q > 0$ is the learning coefficient.

Arrow (1962) chooses cumulative gross investment as index of experience ($E_t = \mathrm{S}I_t$) while other studies (Bairam 1987, Stokey and Lucas 1989) favored cumulative output as an index ($E_t = \mathrm{S}Q_t$) Arrow (1962) argued that the appearance of new machines provides more stimulation to innovation while cumulative output is less inspiring to innovation. In this study both measures are used as proxies of experience. As mentioned above, technological progress is not assumed to be wholly the result of learning-by-doing but other exogenous factors. The technological change index, A_t, is specified as follows:

$$A_t = A_0 e^{l\,t} E_t^q \qquad (4)$$

where l is Hicks-neutral rate of exogenous technological change which is a function of time.

In summing up, the VES production function in which technological progress is partly exogenous and partly the result of learning-by-doing can be presented by

$$Y_t = A_0 e^{l\,t} E_t^q K_t^a L_t^{1-a} e^{bk_t} \qquad (5)$$

Based on this VES model, (Nguyen Tu Anh and Nguyen Thu Thuy 2009) using data in CEIC and their estimates of Vietnam's capital stock, show that Vietnam economic growth in period 1986-2008 is essentially driven by high rate of capital accumulation. The examination shows that there is no evidence of effectiveness of learning-by-doing in Vietnam between 1986-2007. Averagely TFP contributes negligibly to economic growth in the whole period (Table 7).

Table 7: Contribution to economic growth 1986-2007 (%)

Year	GDP Growth	Capital	Labour	TFP
1986	2.79	4.99	1.29	-3.49
1987	3.58	5.70	1.38	-3.49
1988	5.14	5.11	1.42	-1.39
1989	7.36	4.42	1.88	1.06
1990	5.10	3.64	1.90	-0.45
1991	5.96	4.26	1.03	0.67
1992	8.65	4.66	1.22	2.76
1993	8.07	6.70	1.33	0.05
1994	8.84	6.59	1.42	0.83

1995	9.54	6.74	1.34	1.46
1996	9.34	6.51	0.15	2.68
1997	8.15	6.17	1.18	0.81
1998	5.76	6.15	1.17	-1.56
1999	4.77	5.42	1.15	-1.80
2000	6.79	5.39	2.47	-1.08
2001	6.89	5.13	1.38	0.39
2002	7.08	5.27	1.33	0.48
2003	7.34	5.33	1.47	0.54
2004	7.79	5.29	1.36	1.14
2005	8.44	5.28	1.23	1.93
2006	8.23	5.30	1.04	1.88
2007	8.48	6.08	1.05	1.36

Vietnam seems repeat the growth story of NIEs in period 1965-1986 which described by Krugman (1997) "it (high growth rate) was due to forced saving and investment, and long hours of works..." Krugman's [1997] interpretation of these results is very pessimistic since, according to him, the lack of technical progress will inevitably bound the engine of growth as a result of the diminishing returns affecting capital accumulation. However these signals should be taken as a warning not a worrying. Since for long period up to 1986 TFP contributes nothing to growth in NIEs, from 1986 on Lau and Park (2003) finds firm evidences of positive contribution of TFP to growth in these economies. "It is possible that the potential to adopt knowledge and technological from abroad depends on a country's stage of development. Growth in the early stages may be primarily associated with physical and human capital accumulation, and significant potential for growth through catch-up may only emerge once a country has crossed some development threshold" (Collins and Bosworth [1996]). Cuong Le Van *et al* (2010) show that in a developing country with three sectors: consumption goods, new technology, and education, the productivity of the consumption goods depends on a new technology and skilled labor used to produce this new technology. In the first stage of economic growth, the country concentrates on the production of consumption goods; in the second the country must import both physical capital and new technology capital to produce consumption goods and new technology; in the third, the country must import capital and invest in the training and education of high skilled labor.

It is obviously Vietnam now is in initial stage of development process. Negligible contribution of TFP to growth is justifiable. However, in the long run Vietnam needs to reverse this trend to sustain economic growth. The lessons from NIEs indicate that this reverse process essentially requires increasingly improved human capital and capacity of R&D.

2.3.5 Remarks:

In general, Viet Nam is following a similar economic pattern experienced by other East Asian economies, "flying geese", but still is at an earlier stage of regional integration.

- Firstly, the East Asian economies began their growth relying strongly on exports of labor- intensive products but they have gradually gained a comparative advantage shift to increasingly capital and technology-intensive products. At present, Viet Nam's manufacturing exports are concentrated in labor-intensive products such as textiles and garments, footwear, and furniture with low value added in the production value chains.

- Secondly, East Asia has become the largest source of Viet Nam's imports of capital goods for industrial production. However East Asia do not serve as main market for Vietnam's exports, a majority of the markets for the final products is still extra-regional. The significantly increasing role of the EU and the US as important destinations for Viet Nam's exports can also be seen in the case of Viet Nam. China has played an increasing role as a trade partner, especially in intermediate goods and components in East Asia. China has also become a key trade partner of Viet Nam, but with characteristics of the "North–South" trade and a huge deficit on Viet Nam's side.

- Thirdly, Vietnam's industry has move slowly towards higher step on technology ladder. However, this movement is not a real one and characterized by followings:

- Sluggish movement.
- Proportions of value-added to output in both high-tech and low-tech industries steadily decline; high-tech industries decline faster.
- Shortage of supporting industries causes low proportion of value-added to output in both industries. Vietnam's industry not only depends heavily on imported machinery, instruments, and accessory but also increasingly depends on imported intermediaries.
- Value-added in so-called "high-tech industries" are mainly generated at low-tech stage of production chain. In reality, Vietnam has not yet participated in producing of high-tech products. In the last 20 years, there is no evidence of

technological progress in Vietnam. The economy has just grown in width by spending more and more on physical capital, not in depth by improving productivity and technological capacity.

2.4 *Causality between foreign capital, exports and GDP*

In the current literature on Vietnam economic growth, most of published works presume that foreign capital and exports promote growth of GDP without clear evidence. Theoretically, the relationship between these variables is not necessarily unidirectional causality from FDI and exports to GDP. The causality relation may take place in opposite direction. Recent empirical literature shows that the causality relations vary with the period studied, the econometric methods used, treatment of variables (nominal or real), one-way regression or two-way causality, and the presence of other related variables or inclusion of interaction variables in the estimation equation. The results may be bidirectional, unidirectional, or no causality relations.

Liu, Burridge, and Sinclair (2002) found bidirectional causality between each pair of real GDP, real exports, and real FDI for China using seasonally adjusted quarterly data from January 1981 to December 1997; Kohpaiboon (2003) found that, under export promotion (EP) regime, there is a unidirectional causality from FDI to GDP for Thailand using annual data from 1970 to 1999; Alici and Ucal (2003) found only unidirectional causality from exports to output for Turkey using seasonally unadjusted quarterly data from January 1987 to December 2002; Dritsaki, Dritsaki, and Adamopoulos (2004) found a bidirectional causality between real GDP and real exports, unidirectional causalities from FDI to real exports, and FDI to real GDP. for Greece, using annual IMF data from 1960 to 2002; in addition, Ahmad *et al*. (2004) found unidirectional causalities from exports to GDP and FDI to GDP for Pakistan using undeflated annual data from 1972 to 2001. Cuadros, *et al*., (2004) found unidirectional causalities from real FDI and real exports to real GDP in Mexico and Argentina, and unidirectional causality from real GDP to real exports in Brazil using seasonally adjusted quarterly data of Mexico, Brazil, and Argentina from late 1970 to 2000; Chowdhury and Mavrotas (2006) find unidirectional causality from GDP to FDI for Chile, and bidirectional causality between GDP and FDI in the case of Malaysia and Thailand using data from 1969 to 2000. Nair-Reichert and Weinhold (2000) found that the Holtz-Eakin causality tests show FDI, not exports, causes GDP using data from 24 developing countries from 1971 to 1995 applying mixed, fixed and random (MFR) effects model.

Thus, it is very important that the assumptions, the treatment of variables, the sample period, estimation models and methods should be clearly indicated in the analysis. In any case, the general results appear to show the positive relation from FDI and exports

(or trade) to GDP, and that the above brief survey also seems to indicate that there may be some interesting causality relations among exports, FDI, and GDP.

In this section we shall examine the causality among three variables: GDP, foreign capital and exports in Vietnam economy in period 1988-2008. Data are available in CEIC database and GSO (2004) in Vietnam Dong and measured by 1994 price.

The econometric technique requires transforming the values of all real variables into their logarithmic values. The transformed level series are denoted by the lower case letters: gdp, ex, and fdi respectively for logarithm of GDP, exports and foreign capital (including FDI, ODA…). Thus, fluctuations of the variables are considerably mitigated. The econometric technique also calls for taking the first-difference between consecutive logarithmic values, which are the same as the continuous growth rates of the variables, and are denoted by: dgdp, dex, and dfdi in this research.

In this section, we explain the procedures of Granger causality relations between exports, foreign capital, and GDP for each economy using its time-series data. Before analyzing the causality relations, we first employ the unit root test to check the stationarity of each series, and if needed, we then use the cointegration test among the three series. Based on the characteristics of the time-series data, we select either the level series or the first-difference series in the estimation of a vector auto-regression (VAR) model for Granger causality test.

Unit root and Cointegration tests

The most commonly used tests of the unit root in time-series are the Dickey–Fuller (DF) test and the augmented Dickey–Fuller (ADF) test (Dickey & Fuller, 1979, 1981; Said & Dickey, 1984). However, their test critical values (or p-values) for different small sample size has to be approximated asymptotically by simulation methods MacKinnon (1996), applying response surface analysis to annual data, calculated the test p-values (and critical values) for 20 observations. Since our sample has 21 observations, this paper uses MacKinnon's p-values (or critical values) in the DF or ADF unit root test. While the DF or ADF unit root test has been the most commonly used test, there are some other tests which have higher power in the sense that the tests are more likely to reject the null hypothesis H0 of a unit root and accept the alternate Hypothesis H1 of no unit root. However the limitation of observations does not allow us to apply those tests such as DF-GLS test (Elliott, Rothenberg, & Stock, 1996) which requires at least 50 observations.

Table 8 presents the results from ADF unit root tests for level series and first-deference series.

Table 8: ADF unit root tests for level series and first-deference series.

Null Hypothesis: has a unit root				
	Level series		First difference series	
Series	k	t-statistics (p-value)	k	t-statistics (p-value)
gdp	2	-0.8597 (0.7782)		
fdi	1	-9.8535 (0.000)*		
ex	1	-0.888576 (0.7703)		
dgdp			2	-2.9 (0.065)***
dfdi			1	-4.77 (0.0014)*
dex			1	-5.33 (0.0004)*

*Notes: (1) The test equations include constant and linear trend. (2) The lag length (k) is selected by the minimum AIC with maximum lag = 4. (4) *, **, *** denote rejection of null hypothesis at the 1%, 5%, 10% level of significance, respectively.*

On the left column of Table 8, for level series, the fdi is a stationary series but export (ex) and gdp are not stationary ones. Therefore we can not use the level series in the estimation of regressions for causality analysis. On the right column of Table 10, all the first-deference series are stationary series.

Table 9: Johansen cointegration test summary.

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.914095	63.62544	29.79707	0.0000
At most 1 *	0.581383	16.98978	15.49471	0.0296
At most 2	0.023128	0.444599	3.841466	0.5049

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.914095	46.63566	21.13162	0.0000
At most 1 *	0.581383	16.54519	14.26460	0.0214
At most 2	0.023128	0.444599	3.841466	0.5049

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 9 summaries the results from Johansen cointegration test. Both the trace test and the maximum eigenvalue test indicate that the level series, ex, fdi, and gdp, are cointegrated. Based on the results from unit root tests and cointegration test, we have chosen to use the first-difference series in the estimation of the VAR model for causality test for Vietnam.

The VAR model and Granger causality test

We have multi-variables, dex, dfdi, and dgdp, in the VAR(p) model to take into account the interactions among their p-lag variables in testing the Granger causality relations. The VAR(p) model involves estimation of the following system of equations:

$$y_t = \mu + \Lambda_1 y_{t-1} + \Lambda_2 y_{t-2} + ... + \Lambda_p y_{t-p} + \varepsilon_t \quad (6)$$

where y_t is a (3 x 1) column vector of the endogenous variables, i.e., $y_t = (dgdp_t, dfdi_t, dex_t)'$, μ_t is a (3 x 1) constant vector, p the order of lags, each of $\Lambda_1, \Lambda_2, ..., \Lambda_p$ is a (3 x 3) coefficient matrix, each of $y_{t-1}, y_{t-2}, ..., y_{t-p}$ is a (3 x 1) vector of the lag endogenous variables, and ε_t is a (3 x 1) vector of the random error terms in the system. The lag length p in VAR is then selected by the minimum Akaike Information Criterion (AIC) with maximum lag equals to 3 since the numer of observation is limited only to 20. The results show that the optimal lag length is 3.

Table 10 presents the estimated VAR models and the results of Granger causality test. The Granger causality relations are examined using the Wald test of coefficients (F-test), and each null hypothesis is indicated in the footnote of the table.

The results in Table 10 show that there is a strong unidirectional causality from foreign capital to exports, unidirectional causality from foreign capital to GDP (at 5% level of significance) and a rather weak unidirectional causality from exports to GDP (at 10% level of significance). These two causality relations indicate that exports and foreign

capital inflows join together to bring up the growth in GDP. These findings support the export-led growth and the FDI-led growth in Vietnam.

Furthermore, the effects of foreign capital and export on GDP are independent: FDI does not cause export and vise-versa. This implies that FDI inflow to Vietnam mainly to exploit domestic market not for foreign markets; the hypothesis of "FDI not help export" cannot be rejected. On the other hand, high growth rates of export in the last 20 years have not been promotive factor for FDI inflow.

Table 10: Vector Autoregression Estimates VAR (3) and Wald test of coefficient causality direction

Coefficient	Endogenous variables	Dgdp	Dfdi	Dex
c1	DFDI(-1)	-0.00877	0.4458	-0.029
	t statistics	*-0.7255*	*1.12*	*-0.224*
c2	DFDI(-2)	-0.0136	0.054	0.09
	t statistics	*2.723*	*0.33*	*1.68*
c3	DFDI(-3)	0.0075	0.007	-0.04
	t statistics	*-1.928*	*0.055*	*-0.97*
c4	DEX(-1)	0.125	-0.1753	0.054
	t statistics	*2.698*	*-0.115*	*0.108*
c5	DEX(-2)	-0.0652	-0.572	-0.597
	t statistics	*-1.788*	*-0.477*	*-1.52*
c6	DEX(-3)	0.0021	-0.16	-0.34
	t statistics	*0.093*	*-0.213*	*-1.38*
c7	DGDP(-1)	0.0442	-3.08	0.073
	t statistics	*0.095*	*-0.2*	*0.0145*
c8	DGDP(-2)	0.757	10.6	4.533
	t statistics	*1.79*	*0.76*	*0.999*
c9	DGDP(-3)	-0.82	-8.345	1.82
	t statistics	*-2.223*	*0.688*	*0.46*
c	C	0.063	0.268	-0.15
	t statistics	*2.54*	*0.33*	*-0.56*
Wald test 1	Ho	**A**	**B**	**A**
	F-stat	5.19 (*0.034*)**	0.51 (0.68)	1.48 (*0.3*)

Wald test 2	Ho	**B**	**C**	**C**
	F-stat	3.63 (0.073)***	0.21 (0.88)	0.66 (*0.6*)

Notes:(1) The p-values are in the parentheses. (2) In Wald test of coefficients, for VAR(3), the null hypothesis A is c1=c2=c3=0, B is c4=c5=c6 =0, and C is c7=c8=c9 =0, respectively. (3)*, **, ***, denote rejection of null hypothesis at the 1%, 5%, 10%, level of significance, respectively.

Notice that GDP does not cause foreign capital inflow and export. This implies that in general, the steady economic growth in Vietnam during period 1988-2008 is not endogenized in the sense that inflow of foreign capital and exports during the period are crucial factors for economic growth, while economic growth seems not be a factor to promote exports and inflow of foreign capital. These unidirectional causalities may indicate that the economic growth in Vietnam in period 1988-2008 has not been based on productivity improvement but on resources such as cheap unskilled labor and low-tech activities as presented in previous section. Because if economic growth base on incremental productivity, high economic growth means the economy is getting more productive, hence attract more foreign capital and exports become more competitive. If it was the case in Vietnam in period 1988-2008, the directional causality from GDP to foreign capital and exports should be evidenced. As far as these resources are exhausted, the fly-in foreign capital would cease, export would get stagnant, as a result the economic growth would be halted. In short, the result in table 12 shows that the economic growth in Vietnam cannot be sustained if Vietnam fails to improve its production capacity.

3 Conclusion and policy recommendation

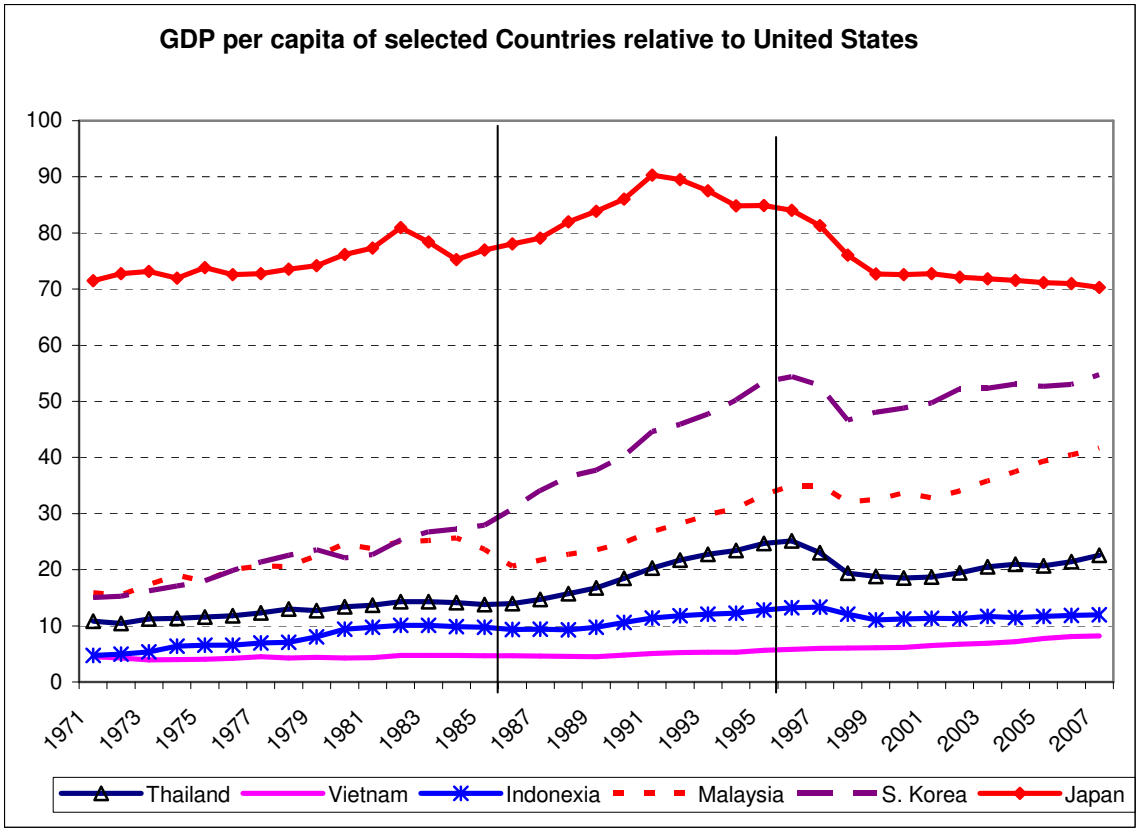
Vietnam's economy has gained fairly high growth rates over the last twenty years. The relative GDP per capita to US has shown slightly upward trend (Figure 13). However, in terms of catch-up, in 22 years from 1986 to 2007 Vietnam only upgraded its relative GDP per capita to United States from 4.65% to 8.18%. At the same time, South Korea increased its figure from 30.84% to 54.72%. Malaysia and Thailand also show big leap forward: from 20.66% and 13.99% to 41.7% and 22.6%. Vietnam's performance slightly outweigh the performance of Indonesia.

Figure 13 also shows that, except for South Korea, Vietnam's neighboring economies seem getting stuck in middle-income trap for long time. The movement of Vietnam and its neighboring economies in Figure 13 indicates the orderly progress of the flock of East Asian economy: the whole flock moves forward, individual economy hardly move relatively to others members.

The economic integration has been evidenced to strongly help economic growth in Vietnam. In the course of catching-up Vietnam, with no doubt, needs integrating

deeper into international economy. However, Vietnam economic growth based crucially on expansion of inputs and depended heavily on imported capital goods (machinery, instrument, accessories, raw materials). There is no evidence of technological improvement in Vietnam over the last two decades. In regional integration Vietnam mainly servers as importing market and assembling factory for other East Asian economies, in contrast, these economies imported limitedly Vietnam's commodities. This is opposite with what advocators of "flying geese" paradigm propose for less developed economies. The paradigm proposes that the international relocation of production of a particular product from a national economy must coincide with gradual reduction of its domestic product. The original exporting economy will transfer gradually production process to the importing economy and eventually import that product. In reality we witness continuous the production in original exporting economy does not decline, TNCs from these economies only move simple part of production (assembling) to followers (like Vietnam) to enhance the competiveness of their exports by taking advantages of cheap labor and other inputs (energy, fee of environmental protection, etc.,) in less developed economies. Hence trade is increasingly a flow of goods within production networks that are organized globally rather than nationally. Whether any territory is included in or excluded from global networks depends on decisions of private actors. States can try to make their territory attractive but cannot dictate the structure of goods production networks. Consequently, the TNCs control almost everything such as technology, marketing network, production structure…and they account for lion share in total value-added that created by the production chain. The followers only benefit a tiny share of value added, as the case of Vietnam.

Figure 13: GDP per capita in PPP of selected countries relative to United States (%)



Source: Pennword table, US's GDP is calculated in real USD and GDP of other countries is calculated in PPP by real USD.

Yoshihora (1988) notes that "most of major components in automobile industry that first and second tier NIEs used are supplied by Japanese firms, some of which are produced locally under their technical supervisors. South East Asian capitalists are essentially distributors of Japanese cars with difference that they have assembly plants. Technologically, however, they are almost 100 percent dependent on their Japanese licensers and under present set-up. It would be impossible for them to become technologically independent; the technological dependence is not temporary but being structural semi-permanent."

As soon as Vietnam is locked in a hard structure of international production that controlled by TNCs, it hardly improves its position in the structure since this improvement depends essentially on TNCs' decision. For example, TNCs' chose Thailand as the place to produce automotive components and spare parts, and Vietnam as an assembling factory. Vietnam hardly be able to upgrade its position to Thailand's position, because this is costly for TNCs as they had invested largely in Thailand which can not be forgone. Furthermore, assembling factory does not require much investment,

TNCs can easily leave the country when the business environment becomes unfavorable. It means that lower position suffers more uncertainty.

In Vietnam, FDI and export firmly cause economic growth but there is no evidence of GDP causing FDI inflow and exports in Vietnam economy since *Doi Moi*. This implies that over the last two decades FDI and exporting industry in Vietnam essential exploit its static advantages such as cheap labor, and raw material …Vietnam has not yet created dynamic comparative advantages such as high productivity of labor and capital.

Without technological improvement, no dynamic comparative advantage Vietnam's economic growth would vanish soon, due to law of diminishing marginal productivity. Hence, the most severe risk that Vietnam has to face in process of economic integration for development is the risk of being locked in "lame duck" position in the East Asian "flying geese". Improving technological capacity and human capital stock is essential. The former requires technology transfer from developed economies. This process is not automatic and constrained by severe conditions for developing economies.

3.1 *Constraints in technological acquisition*

In principle, economy with poor resources related to R&D such as highly educated human capital, stock of accumulated knowledge, broad base of industrial foundation etc.,… hardly generates technology. A novel technology is firstly invented in a developed economy, then applied to produce for domestic customers' taste for experiment and modification. At this stage price is inelastic due to monopoly and lack of standardization and information. Secondly, the matured products in domestic market will be exported to economies with similar level of income and taste. The super profit in monopoly markets induces competitor racing for that technology. Under competition, the inventing firm needs standardizing their product and moving part of production process to importing economy to reduce cost of production and maintain their competiveness. At this stage less developed economy like Vietnam, is probable to acquire technology. However, due to standardization the crucial portion of production costs at this stage is marketing costs. Less developed economy usually lacks of distribution network, market relations, therefore, hardly competes with developed economy even they are able to obtain and absorb technology.

Technological transfer through FDI by TNCs does not occur automatically. In fact empirical analysis on productivity spillovers from FDI has found relatively limited positive effects. Hill and Athukorala (1998) shows that spillover will be positively

associat ned with competition and negatively associated with the productivity gap between foreign and domestic firms; very large gap renders the technology absorption by domestic firms more difficult.

Increasing technological complexity make the technological acquisition more difficult: higher start-up costs, more complicated know-how requirement, steeper learning curve and more intensified specialization. In addition to TNCs' reluctance to transfer technology as mentioned above, the original exporting state may be pressured to raise trade barriers so to protect the declining industries under the so called "senile industry protection".

3.2 *Policy recommendation*

Given its limited resource, Vietnam needs to identify and adopt an appropriate integration roadmap. As a member of ASEAN, Vietnam should continue to support and promote ASEAN integration, especially the materialization of the AEC, as well as East Asian integration in which ASEAN play a vital role. However Vietnam should not lock itself in the regional production network. Without competition between firms in various developed economies who hold technological capacity, Vietnam rarely is able to acquire technologies it needs. FDI policy should looks globally not regionally; attracting firms from advanced economic partners, i.e. those with strengths in investment, technology transfers, and human resource development, etc such as United States, EUs, Russia etc.,… should put in priority. In this line, the forms of bilateral cooperation can go beyond the economic and trade arrangements.

Vietnam needs to find itself appropriately positioned in the game to reap the benefits from a fast growing China, as well as in the regional production network in order to avoid the so-called "low cost labor trap". There have been a number of opportunities for Vietnam to enter a "win-win" game with China. For instance, China has a huge market, with fast growth in economic size and consumption. Foreign investors also have high expectation of Vietnam's growth prospects and many like to invest relying on the "China + 1" strategy.

Over more than 20 years, Vietnam enjoyed high growth rate and a large amount of capital accumulated in the economy. The immature financial sector, choices of financial assets are limited, hence the accumulated capital find their way in to bubble market such as real estates, and stock market. Financial development should be accelerated to absorb those accumulated capital. More transparent in real estate sector is

crucial condition to reduce speculative activities and reverse capital to more productive activities and R&D.

Educational and R&D activities should closely link with business sector.

In long-term, to overcome the obstacle of core technology and marketing network Vietnam needs to acquire some TNCs. Hence, in medium-term Vietnam should encourage entrepreneurs to accumulate capital towards that target.

4 Reference

Aghion, P. and P. Howitt (1992), "A Model of Growth Through Creative Destruction", *Econometrica*, 60, 323-351.

Ahmad, M. H., Alam, S., and Butt, M. S. (2004), "Foreign direct investment, exports and domestic output in Pakistan". Paper presented at *the 19th Annual General Meeting, PIDE*, Quaid-e-Azam University, Islamabad.

Akamatsu K., (1961), A theory of unbalanced growth in the world economy, *Weltwirtschaftliches Archiv Review of World Economics,* 86:3.25.

Akamatsu K., (1962), A historical pattern of economic growth in developing countries. *Journal of Developing Economies,* 1(1):3.25, March, August.

Alici, A. A., and Ucal, M.S. (2003). "Foreign direct investment, exports and output growth of Turkey: Causality analysis". Paper Presented at *the European Trade Study Group (ETSG), Fifth Annual Conference*, Universidad Carlos III de Madrid, Madrid.

Arkadie, B. and R. Mallon (2003), Vietnam a transition tiger, Asia Pacific Press, Canberra.

Arrow K.J., H.B. Chenery, B.S. Minhas, and R.M. Solow, (1961),"Capital – Labor Substitution and Economic Efficiency", *The Review of Economics and Statistics*, Volume XLIII, No3, 225-250.

Asian Development Bank (ADB), 2006, 'Economy in Transition: From Doi Moi to WTO'. Online. Available at: http://www.adb.org/documents/reports/consultant/economic-transition-in-vietnam

Bairam, Erkin, (1989), "Learning-by-doing, Variable Elasticity of Substitution and Economic Growth in Japan, 1878-1939", *Journal of Development Studies* 25, pp 344-353.

CEIC database: http://www.ceicdata.com

Chowdhury, A., and Mavrotas, G. (2006), "FDI and growth: What causes what?" *World Economy*, 29(1), 9–19.

Cuadros, A., Orts, V., and Alguacil, M. (2004), "Openness and growth: Re-examining foreign direct investment, trade and output link ages in Latin America", *The Journal of Development Studies*, 40(4), 167–192.

Cuong Le Van, Nguyen Tu Anh, Nguyen Manh Hung and Thai Bao Luong (2010), "New technology, human capital, and growth in developing country", short coming in, *Mathematical Population Studies*.

Dickey, D. A., and Fuller, W. A. (1979), "Distribution of the estimators for autoregressive time series with a unit root", *Journal of the American Statistical Association*, 74(366), 427–431.

Dinh Van An, 2009, 'Economic reforms and development in Vietnam: Outcomes in 2008 and prospects for 2009'. Mimeo.

Dritsaki, M., Dritsaki, C., and Adamopoulos, A. (2004), "A causal relationship between trade, foreign direct investment, and economic growth for Greece". *American Journal of Applied Sciences*, 1(3), 230–235.

Elliott, G., Rothenberg, T. J., and Stock, J. H. (1996), "Efficient tests for an autoregressive unit root", *Econometrica*, 64(4), 813–836.

GSO 2009, Statistical yearbook of Vietnam 2008.

Grossman, G. and E. Helpman (1991), *Innovation and Growth in the Global Economy*, The MIT press, Cambridge, Massachusetts.

Hill H and Athukorala P (1998), "Foreign investment in East Asia: A survey", *Asian-Pacific Economic Literature*, 12(2): 23-50, November.

Kim, J., and Lau, L., (1994), "The Sources of Economic Growth in the East Asian Newly Industrial Countries", *Journal of Japanese and International Economics*, 8

Kohpaiboon, A. (2003). "Foreign trade regimes and FDI-growth nexus: A case study of Thailand". *The Journal of Development Studies*, 40(2),55–69.

Krugman, P., (1994), "The Myth of Asia's Miracle", *Foreign Affairs*, 73, 62-78.

Lau, L. and J. Park, (2003), "The Sources of East Asian Economic Growth Revisited", *Conference on International and Development Economics in Honor Henry Y. Wan, Jr.*, Cornell University, Ithaca, September 6-7

Liu, X., Burridge, P., and Sinclair, P. J. N. (2002). "Relationships between economic growth, foreign direct investment and trade: Evidence from China", *Applied Economics*, No. 34, 1433–1440.

Lucas, R.E. Jr. (1988), "On the Mechanics of Economic Development," *Journal of Monetary Economics*, 22, 1 (July), pp. 3-42

Mac Kinnon, J. G. (1996), “Numerical distribution functions for unit root and cointegration tests”, *Journal of Applied Econometrics*, 11, 601–618.

Nair-Reichert, U., and Weinhold, D.(2000), “Causality tests for cross-country panels: New look at FDI and economic growth in developing countries.” *Oxford Bulletin of Economics and Statistics*, 64, 153–171.

Nguyen Thi Tue Anh. (2005). “Effect of Foreign Direct Investment on Economic Growth in Vietnam”. Mimeo

Nguyen Tu Anh and Nguyen Thu Thuy 2009 “Vietnam economic growth in 1986-2007: role of TFP and learning-by-doing”, working paper.

Ozawa T (1991). The dynamics of Pacific Rim industrialization: How Mexico can join the Asian flock of flying geese. In: Roett R, ed., *Mexicos External Relations in the 1990s*. Boulder and London, Lynne Rienner Publications.

Rebelo, S., (1991), "Long-run Policy Analysis and Long-run Growth", *Journal of Political Economy*, 99, 500-521.

Revankar, N.S., (1971),"A Class of Variable Elasticity Substitution Production Functions" *Econometrica*, Vol. 39, No.1:61-71.

Rodrik, D., (1995), "Getting Interventions Right: How Korea and Taiwan Grew Rich", *Economic Policy*, 20

Romer, P.M. (1986), "Increasing Returns and Long Run Growth", *Journal of Political Economy*, 94, 1002-1037.

Romer, P.M. (1987), "Growth based on Increasing Returns Due to Specialization" , *American Economic Review*, 77, 56-62.

Romer, P.M. (1990), "Endogenous Technological Change", *Journal of Political Economy*, 98, S71-S103

Said, S. E., and Dickey, D. A. (1984), “Testing for unit roots in autoregressive-moving average models of unknown order”, *Biometrika*, 71, 599–607.

Shigehisa K. (2004), “The flying geese paradigm: A critical study of its application to East Asian regional development”, *Discussion paper No. 169*, United Nation Conference on Trade and Development

Solow, R., “A Contribution to the Theory of Economic Growth”, *The Quarterly Journal of Economics*, 70, 65-94, 1956.

Stokey, N. and R.Lucas with E.Prescott (1989), Recursive Methods in Economic Dynamics, Harvard University Press.

Vo T.T., and Pham C.Q., (2008), "Managing capital flow: the case of Vietnam", *ADB Institute discussion paper No. 105.*, ADB Institute.

Vo Tri Thanh, 2005, 'Process of Economic Reforms in Vietnam: What Lessons Can Be Learnt From?', *Paper presented at the International Economic Association Round Table on 'Market and Socialism Reconsidered'*, Hong Kong University of Science and Technology, Hong Kong, 14-15 January.

World Bank, (1993), *The East Asian Miracle: Economic Growth and Public Policy*, Oxford University Press, Oxford.

World Bank 2009, World Development Indicators 2009…

Yoshihara K (1988), "The Rise of Ersatz Capitalism in South East Asia", Singapore, Oxford University Press.

Young, A., (1994) "Lessons from East Asian NICs: a Contrarian View", *European Economic Review*, 38, 964-973, 1994

Young, A., (1995), "The Tyranny of Numbers: Confronting the Statistical Realities of the East Asian Growth Experience", *The Quarterly Journal of Economics*, 110, 641-680